Charged Current Event Analysis by Scanning

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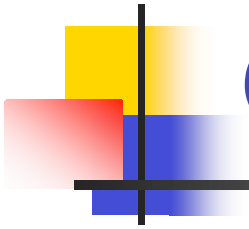


Overview

- Reporting on analysis done by Tony Mann, Aaron McGowan and myself
- Scanned Far Detector spill files (.bntp files—entire data sample) through 31 January 2006
- Looked at all events that reconstructed with either a track or a shower (1423 snarls total)
- Tony scanned with NueAna; Aaron and I scanned with Mad
- Scanned 3607 Monte Carlo events (carrot, R1_18_2) flux is 5.82e20+2.7%

Scanning Criteria

- Same for data and MC
- Intentionally aggressive on fiducial volume
- Required vertex contained on side by ≥10 cm
- Required vertex contained by 50 cm in front
- Required evidence for exiting track in rear
- No cuts for coil hole or space between supermodules
- “Rock events” were identified as either “front” or “side,” but not otherwise used in this analysis (see Aaron McGowan’s analysis)

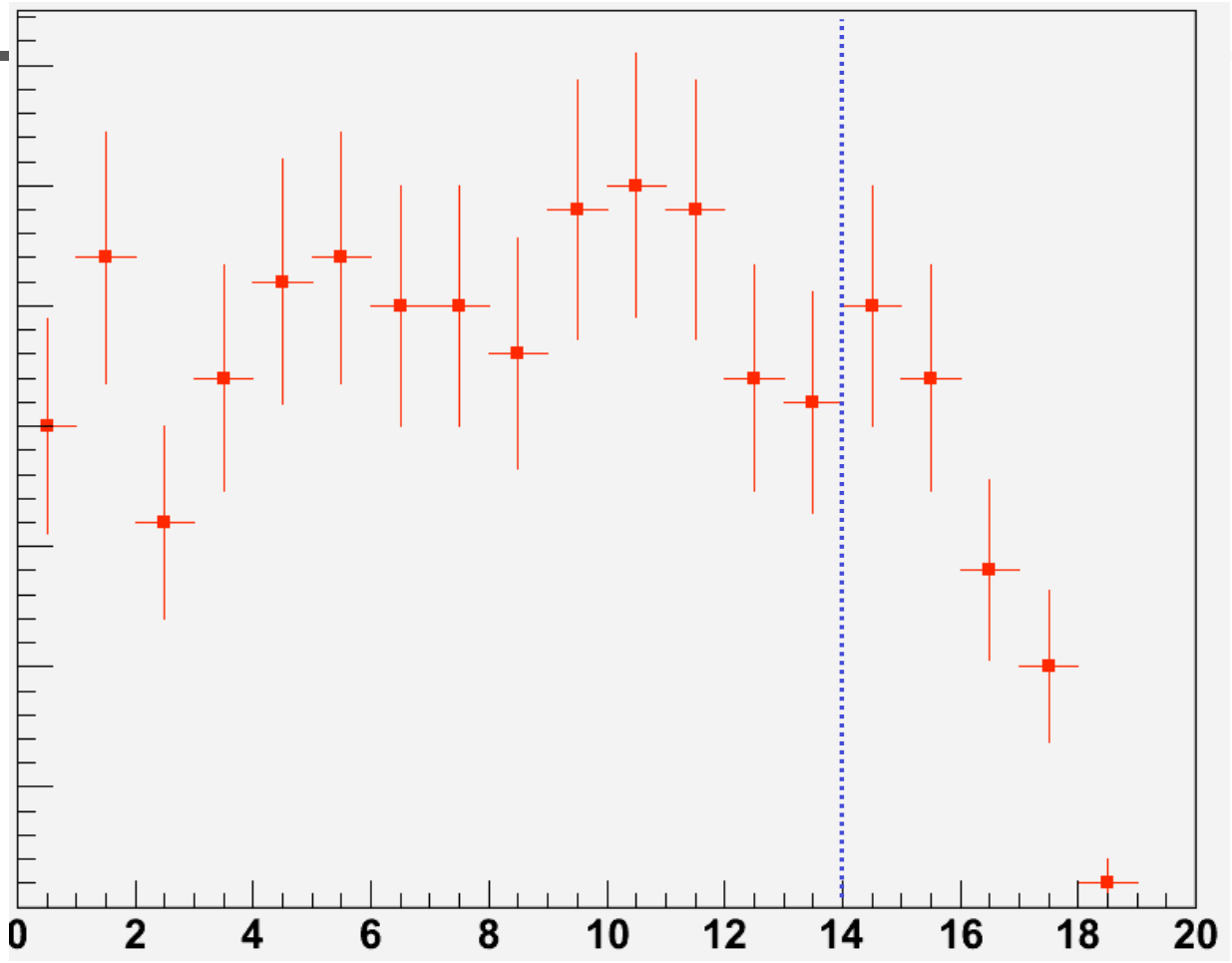
Scanning Criteria

- Cosmic rays identified by timing (relative to spilltimend database), by topology (generally vertical, usually completely cross detector) and by momentum (usually high)
- Likely negligible contamination due to cosmics

Scanning Criteria

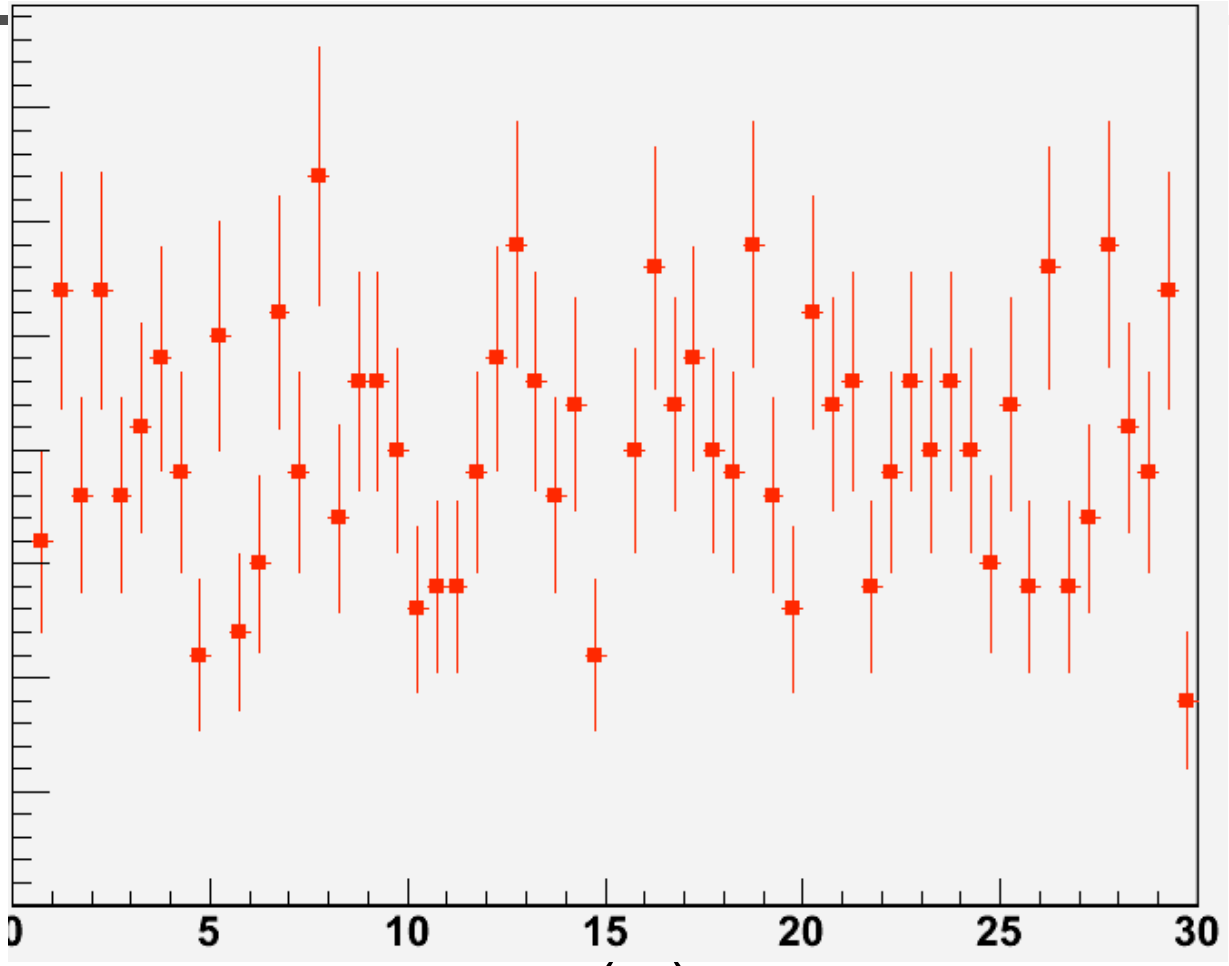
- Charged current events by looking for uniformly ionizing, penetrating track
- ~90% of events, cc identification is easy
- Hardest events are where track barely exits from shower near vertex
- Some events are classified as ambiguous
- Plan to present detailed scanning statistics at collaboration meeting

Vertex Radius Squared (x-y)



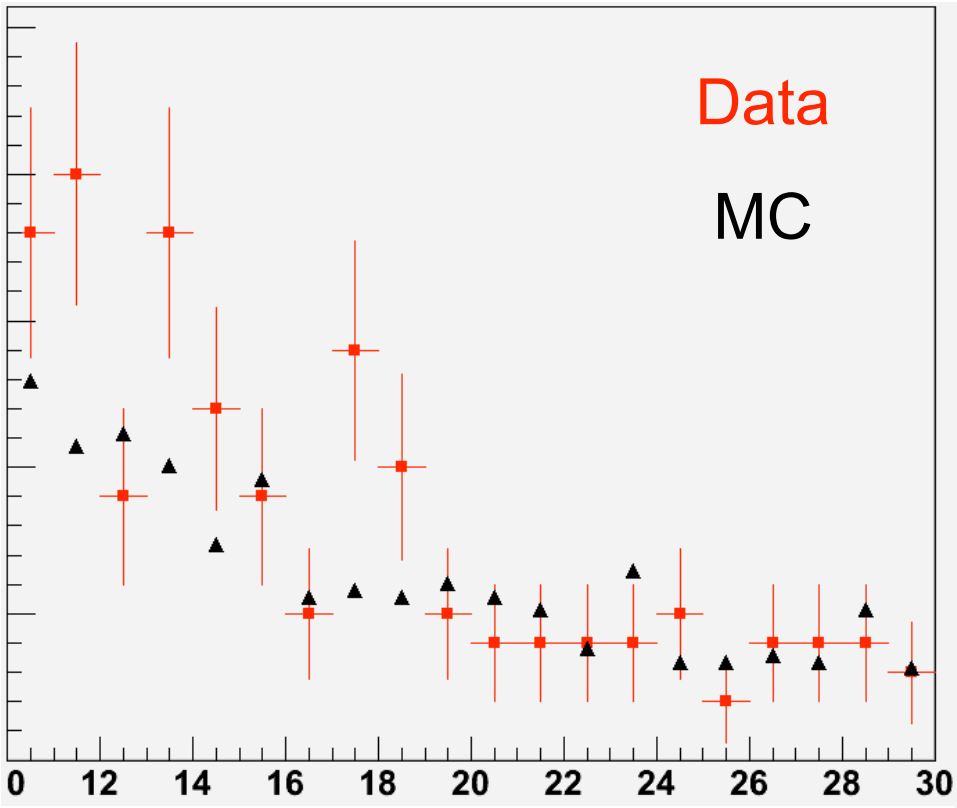
Radius^2 (m^2)

Vertex z Position

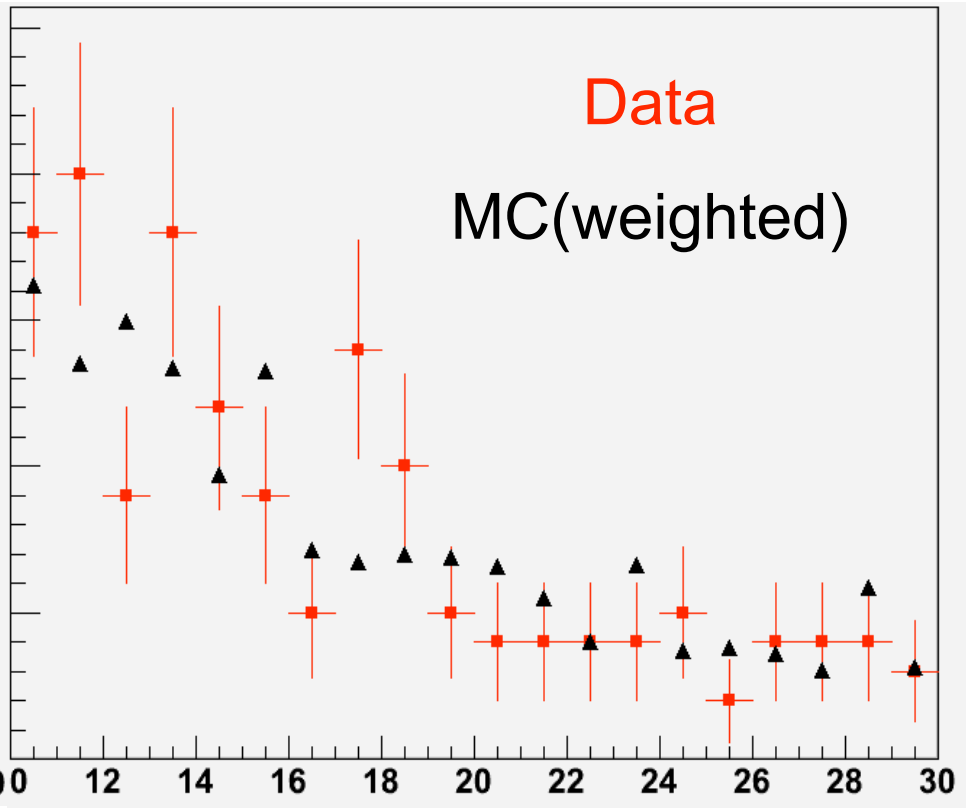


Weighting of MC is by ratio ($Data_{near}$)/(MC_{near})

Energy Spectrum ≥10 GeV



Energy (GeV)



Energy (GeV)

Looking Forward

- So far very simple analysis; can certainly be improved
- Far Detector MC does not fit data well for $E \geq 10$ GeV. Reweighting MC by ratio of $(Data_{near})/(MC_{near})$ yields much better agreement
- Method appears usable to determine neutrino oscillation parameters